

PROTRACTOR AND RULER COMBINATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a protractor and ruler combination,
5 and more particularly to a protractor and ruler combination, wherein the included angle between the ruler section of the main ruler and the ruler section of the auxiliary ruler is measured exactly.

2. Description of the Related Art

A conventional protractor and ruler combination 10 in accordance
10 with the prior art shown in Figs. 7-9 comprises a ruler 20 having a first side formed with a plurality scales 201 and a second side 202 formed with a contrast portion 203 having a reading scale 204, a protractor 30 rotatably mounted on the ruler 20 and having a plurality scales 301, a threaded rod 302 mounted on the protractor 30 and extended through the ruler 20, a washer 303
15 mounted on the threaded rod 302, and a nut 304 screwed on the threaded rod 302. In practice, the ruler 20 is rotated relative to the protractor 30 as shown in Fig. 9, so that the user can identify the included angle between the ruler 20 and the protractor 30 by matching the reading scale 204 of the contrast portion 203 with one of the scales 301 of the protractor 30.

20 However, the user cannot identify the included angle between the ruler 20 and the protractor 30 exactly. In addition, the ruler 20 rubs the protractor 30 frequently, so that the scales 301 of the protractor 30 are easily

worn out due to frequent friction and contact, thereby causing inconvenience to the user in identification and measurement of the included angle between the ruler 20 and the protractor 30.

SUMMARY OF THE INVENTION

5 The primary objective of the present invention is to provide a protractor and ruler combination, wherein the auxiliary ruler is moved relative to the main ruler, and the secondary ruler is moved in concert with the auxiliary ruler on the protractor of the main ruler, so that the included angle between the ruler section of the main ruler and the ruler section of the auxiliary ruler is
10 measured exactly.

 Another objective of the present invention is to provide a protractor and ruler combination, wherein the auxiliary ruler and the secondary ruler are moved on the protractor of the main ruler by guidance of the guide slot of the protractor, so that the auxiliary ruler and the secondary ruler are moved rigidly
15 and stably, thereby facilitating the user operating the protractor and ruler combination.

 A further objective of the present invention is to provide a protractor and ruler combination, wherein the anti-skid pad is moved with the ruler section of the auxiliary ruler on the surface of the article to provide an anti-skid
20 effect and to prevent the auxiliary ruler from scratching the surface of the article.

A further objective of the present invention is to provide a protractor and ruler combination, wherein the anti-skid pad separates the auxiliary ruler from the surface of the article, thereby preventing the ink of a pen from infiltrating into the surface of the article from the auxiliary ruler.

5 A further objective of the present invention is to provide a protractor and ruler combination, wherein the anti-skid pad separates the ruler section of the auxiliary ruler from the ruler section of the main ruler, thereby preventing the auxiliary ruler and the main ruler from being worn out due to frequent friction and contact.

10 A further objective of the present invention is to provide a protractor and ruler combination, wherein the support member is rested on the surface of the article, thereby facilitating the user moving the auxiliary ruler on the surface of the article.

In accordance with the present invention, there is provided a
15 protractor and ruler combination, comprising a main ruler, a secondary ruler, and an auxiliary ruler, wherein:

the main ruler has a first side formed with a protractor having a plurality scales;

the secondary ruler is rotatably mounted on the main ruler and has a
20 plurality reading scales; and

the auxiliary ruler has a first side secured on the secondary ruler, so that the secondary ruler is moved in concert with the auxiliary ruler on the protractor of the main ruler.

Further benefits and advantages of the present invention will become
5 apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a protractor and ruler combination in accordance with the preferred embodiment of the present invention;

10 Fig. 2 is an exploded perspective view of the protractor and ruler combination as shown in Fig. 1;

Fig. 3 is a plan cross-sectional view of the protractor and ruler combination as shown in Fig. 1;

15 Fig. 4 is a partially cut-away enlarged view of the protractor and ruler combination as shown in Fig. 3;

Fig. 5 is a top plan operational view of the protractor and ruler combination as shown in Fig. 1;

Fig. 6 is a partially cut-away enlarged view of the protractor and ruler combination as shown in Fig. 5;

20 Fig. 6A is a partially plan expansion view of the protractor and ruler combination as shown in Fig. 6;

Fig. 7 is a perspective view of a conventional protractor and ruler combination in accordance with the prior art;

Fig. 8 is an exploded perspective view of the conventional protractor and ruler combination as shown in Fig. 7; and

5 Fig. 9 is a top plan operational view of the conventional protractor and ruler combination as shown in Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to Figs. 1-4, a protractor and ruler combination 6 in accordance with the preferred embodiment of the
10 present invention comprises a main ruler 1, a secondary ruler 2, and an auxiliary ruler 3.

The main ruler 1 has a first side formed with a protractor 16 connected to the ruler section 11 and having a plurality scales 17 and a second side formed with a ruler section 11 having a plurality scales 12.

15 The ruler section 11 of the main ruler 1 has a distal end formed with a fixing hole 13, and the protractor and ruler combination 6 further comprises a support member 14 pivotally mounted on the ruler section 11 of the main ruler 1, and a pivot shaft 15 extended through an end of the support member 14 and fixed in the fixing hole 13 of the ruler section 11.

20 The protractor 16 of the main ruler 1 has a center formed with a through hole 19 and has a periphery formed with an arc-shaped guide slot 18.

The secondary ruler 2 having a semi-circular shape is rotatably mounted on the main ruler 1 and has a plurality reading scales 21.

The sizes of the reading scales 21 of the secondary ruler 2 are determined according to an inner diameter of the scales 17 of the protractor 16.

5 The secondary ruler 2 has a center formed with a through hole 22 aligning with the through hole 19 of the protractor 16 and has a periphery formed with a through bore 23 aligning with the guide slot 18 of the protractor 16.

10 The auxiliary ruler 3 has a first side formed with a through hole 33 aligning with the through hole 22 of the secondary ruler 2 and a through bore 34 aligning with the through bore 23 of the secondary ruler 2 and a second side formed with a ruler section 31 having a plurality scales 32.

15 The protractor and ruler combination 6 further comprises an anti-skid pad 35 mounted on the ruler section 31 of the auxiliary ruler 3 and located beside the secondary ruler 2.

20 The protractor and ruler combination 6 further comprises a pivot pin 4 extended through the through hole 33 of the auxiliary ruler 3, the through hole 22 of the secondary ruler 2 and the through hole 19 of the protractor 16, and a snap member 41 secured on a distal end of the pivot pin 4. The protractor and ruler combination 6 further comprises a screw member 5 extended through the guide slot 18 of the protractor 16, the through bore 23 of the secondary ruler 2 and the through bore 34 of the auxiliary ruler 3, and a nut 51 screwed on

the screw member 5. In such a manner, the secondary ruler 2 is moved in concert with the auxiliary ruler 3 on the protractor 16 of the main ruler 1.

In practice, referring to Figs. 1-6, the ruler section 11 of the main ruler 1 is rested on an edge of an article 7, and the support member 14 is pivoted on the ruler section 11 of the main ruler 1 and rested on a surface of the article 7. Then, the auxiliary ruler 3 is moved outward relative to the main ruler 1 to the position as shown in Fig. 5, and the secondary ruler 2 is moved in concert with the auxiliary ruler 3 on the protractor 16 of the main ruler 1, so that the reading scales 21 of the secondary ruler 2 are moved relative to the scales 17 of the protractor 16.

When either one of the reading scales 21 of the secondary ruler 2 is in alignment with a respective one of the scales 17 of the protractor 16, the respective scale 17 of the protractor 16 indicates the exact angular value between the ruler section 11 of the main ruler 1 and the ruler section 31 of the auxiliary ruler 3 as shown in Fig. 5. For example, as shown in Fig. 6, when the value "0" of the reading scales 21 of the secondary ruler 2 is in alignment with the respective value "40" of the scales 17 of the protractor 16, the included angle between the ruler section 11 of the main ruler 1 and the ruler section 31 of the auxiliary ruler 3 as shown in Fig. 5 is read as 40 degrees.

Referring to Fig. 6A, ten intervals of the reading scales 21 of the secondary ruler 2 are corresponding to nineteen intervals (19mm) of the scales 17 of the protractor 16, so that each interval of the reading scales 21 of the

secondary ruler 2 is equal to 1.9mm. In addition, every ten intervals of the reading scales 21 of the secondary ruler 2 are spaced from every ten intervals of the scales 17 of the protractor 16 by 1.0mm, so that each interval of the reading scales 21 of the secondary ruler 2 is spaced from each interval of the scales 17 of the protractor 16 by 0.1mm. Thus, the included angle between the ruler section 11 of the main ruler 1 and the ruler section 31 of the auxiliary ruler 3 is exactly measured to reach the precision of 0.1mm.

Accordingly, the auxiliary ruler 3 is moved relative to the main ruler 1, and the secondary ruler 2 is moved in concert with the auxiliary ruler 3 on the protractor 16 of the main ruler 1, so that the included angle between the ruler section 11 of the main ruler 1 and the ruler section 31 of the auxiliary ruler 3 is measured exactly. In addition, the auxiliary ruler 3 and the secondary ruler 2 are moved on the protractor 16 of the main ruler 1 by guidance of the guide slot 18 of the protractor 16, so that the auxiliary ruler 3 and the secondary ruler 2 are moved rigidly and stably, thereby facilitating the user operating the protractor and ruler combination 6. Further, the anti-skid pad 35 is moved with the ruler section 31 of the auxiliary ruler 3 on the surface of the article 7 to provide an anti-skid effect and to prevent the auxiliary ruler 3 from scratching the surface of the article 7. Further, the anti-skid pad 35 separates the auxiliary ruler 3 from the surface of the article 7, thereby preventing the ink of a pen from infiltrating into the surface of the article 7 from the auxiliary ruler 3. Further, the anti-skid pad 35 separates the ruler section 31 of the auxiliary ruler

3 from the ruler section 11 of the main ruler 1, thereby preventing the auxiliary ruler 3 and the main ruler 1 from being worn out due to frequent friction and contact. Further, the support member 14 is rested on the surface of the article 7, thereby facilitating the user moving the auxiliary ruler 3 on the surface of the article 7.

Although the invention has been explained in relation to its preferred embodiment(s) as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claim or claims will cover such modifications and variations that fall within the true scope of the invention.